

Appl. No. 10/027,667  
Atty. Docket No. 8828  
Amdt. dated 06/10/2004  
Reply to Office Action of 03/10/2004  
Customer No. 27752

### REMARKS

Claims 1 - 93 are pending in the present application. The Applicants have amended claims 1 and 63 to particularly point out and distinctly claim the subject matter that the Applicants regard as their invention. Support for the present amendments is found throughout the specification and claims as originally filed. No new matter has been added and no additional claims fee is believed to be due.

Upon the filing of the present amendment, the Applicants wish to schedule an Interview to discuss the present application with the Examiner of Record. Accordingly, the Applicants respectfully request that the Examiner contact the undersigned and provide his availability for such a meeting after having had the opportunity to consider the present communication.

### Rejection Under 35 USC 102 Over Herrington

The Office Action states that claims 1-2, 24 and 29-31 are rejected under 35 USC 102(e) as being anticipated by US Patent Number 6,261,464 to Herrington et al (hereinafter "Herrington"). Specifically, the Office Action states that Herrington teaches an apparatus for electrolyzing an electrolytic solution, wherein said apparatus comprises: (1) a non-barrier electrolytic cell comprising an anode, a cathode, an inlet port and an outlet port; and (2) a current supply for providing an electrical current from said anode to said cathode, wherein the current supply delivers less than about 5 watts of power. The Applicants respectfully disagree with the finding of anticipation over Herrington.

The Applicants wish to note that claim 1, from which the balance of the above-rejected claims ultimately depend, relates to an apparatus for electrolyzing an electrolytic solution comprising an anode, a cathode, an inlet port for receiving a flow of electrolytic solution and an outlet port for providing an exit for the flow of electrolytic solution. Indeed, the Applicants wish to underscore that the inlet and outlet ports of the apparatus described in claim 1 are separate. The two distinct inlet and outlet ports of the apparatus of claim 1 are further illustrated in Figure 1, wherein numeral 25 denotes a cell inlet through which the aqueous feed solution can pass into the cell, and numeral 26 denotes an opposing and separate cell outlet from which the effluent can pass out of the electrolysis cell. The present application neither describes, nor lays claim to, an apparatus for electrolyzing an electrolytic solution comprising a single port that can be used as both an inlet and an outlet. Additionally, the Applicants have amended claim 1, from which the balance of the above-rejected claims ultimately depend, to underscore that the apparatus of the present invention comprises a direct current supply that delivers less than 5 watts of power.

Appl. No. 10/027,667  
Atty. Docket No. 8828  
Amdt. dated 06/10/2004  
Reply to Office Action of 03/10/2004  
Customer No. 27752

Conversely, Herrington relates entirely to a batch device with a holding chamber and, importantly, a single port that is employed as both an inlet for receiving a flow of electrolytic solution and an outlet for exiting the electrolytic solution. Further, the apparatus of Herrington is adapted to create a concentrate that can be added to water for disinfection. The apparatus of the present invention is designed for the direct and continuous disinfection of water via entry of said water through the inlet of the claimed device and exit through a separate and distinct outlet. Such direct and continuous disinfection of water is not possible using the single port-comprising device of Herrington. The Applicants further submit that Herrington fails to disclose the direct current supply of claim 1, as amended, which delivers less than about 5 watts of power. Thus, the Applicants submit that Herrington fails to disclose each and every element of the claim 1, from which the balance of the rejected claims ultimately depend. To reiterate, Herrington fails to disclose a apparatus for electrolyzing an electrolytic solution comprising two, separate and distinct inlet and outlet ports. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the rejection to claims 1-2, 24 and 29-31 under 35 USC 102(e).

Rejection Under 35 USC 102(e) over Weakly

The Office Action states that claims 1, 3 and 5-31 are rejected under 35 USC 102(e) as being anticipated by US Patent Application Publication 2002/0157966A1 to Weakly et al (hereinafter "Weakly"). Specifically, the Office Action states that Weakly teaches an apparatus for electrolyzing an electrolytic solution, said apparatus comprising: (1) a non-barrier electrolytic cell comprising an anode, a cathode, an inlet port and an outlet port; and (2) a current supply for providing an electrical current from said anode to said cathode, said current delivering less than about 5 watts of power. The Applicants respectfully disagree with the finding of anticipation.

The Applicants respectfully direct the Examiner's attention to the "Amendments" section of the instant paper, in which the Applicants have amended claim 1, from which the balance of the rejected claims ultimately depend, to particularly point out and distinctly claim the subject matter that the Applicants regard as their invention. Specifically, the Applicants have amended claim 1 to underscore that the apparatus of the present invention comprises a direct current supply that delivers less than about 5 watts of power. Support for the present amendments is found throughout the specification and claims, as originally filed, and specifically on page 14 of the present specification.

In light of the present amendments, the Applicants respectfully submit and strongly urge that Weakly fails to disclose each and every element of the present invention as defined by the amended claims. The disclosure of Weakly is limited entirely to an apparatus adapted for use

Appl. No. 10/027,667  
Atty. Docket No. 8828  
Amdt. dated 06/10/2004  
Reply to Office Action of 03/10/2004  
Customer No. 27752

with an alternating current. Indeed, the Applicants submit that the use of an alternating current in conjunction with the remaining elements of the present invention results in loss of a continuous electrical field and loss of unidirectional flow of ions. In turn, the loss of this electrical field and unidirectional flow results in loss of efficiency and lower percent conversion. Further, the Applicants submit that the alternating current system of Weakly prohibits the use of the subject device with batteries, and thus, inhibits the portability of the subject device. Thus, the Applicants submit that Weakly fails to teach each and every element of the claimed invention, as amended. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the rejection to claims 1, 3 and 5-31 under 35 USC 102(e) over Weakly.

Rejection Under 35 USC 102(b) over Ando

The Office Action states that claims 1, 3, 63 and 65 are rejected under 35 USC 102(b) as being anticipated by US Patent 5,534,120 to Ando et al (hereinafter "Ando"). Specifically, the Office Action states that Ando teaches an apparatus for electrolyzing an electrolytic solution, said apparatus: (1) a non-barrier electrolytic cell comprising an anode (Figure 1, numerals 16, 20), a cathode (Figure 1, numeral 18), an inlet port (Figure 2, numeral 26) and an outlet port (Figure 2, numerals 28, 30); and (2) a current supply for providing an electrical current from said anode to said cathode, wherein said current supply delivers less than about 5 watts of power. The Office Action further states that the specific power of the current supply is a method limitation which does not further define the structure in the claimed apparatus. The Applicants respectfully disagree with the finding of anticipation.

Again, the Applicants wish to direct the Examiner's attention to the "Amendments" section of the instant paper, in which the Applicants have amended claims 1 and 63, from which the balance of the aforementioned claims ultimately depend, to particularly point out and distinctly claim the subject matter that the Applicants regard as their invention. Support for the present amendments is found throughout the specification and claims, as originally filed, and specifically on page 14 of the present specification. In particular, the Applicants have amended claims 1 and 63 to underscore that the present apparatus comprises a direct current power supply, which delivers less than 5 watts of power. In light of the present amendments, the Applicants submit that Ando fails to disclose each and every element of the apparatus of the present application, as amended, comprising a direct current supply delivering less than 5 watts of power. Instead, the subject apparatus of Ando is associated with a power consumption level of about 20 watts.

Appl. No. 10/027,667  
Atty. Docket No. 8828  
Amdt. dated 06/10/2004  
Reply to Office Action of 03/10/2004  
Customer No. 27752

The Applicants further wish to note that Ando relates entirely to a split stream, with one inlet and two outlets. Indeed the device of Ando comprises two, separate streams – one having an acidic solution and the other having an alkaline solution. Conversely, the apparatus of the present invention comprises a single stream with one inlet and one outlet. This is particularly important because the split stream system of Ando results in a solution that is too acidic for human consumption, and thus, can only be employed in the context of disinfection. Thus, Ando fails to teach each and every limitation of the present claims, as amended. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the rejection to claims 1, 3, 63 and 65 under 35 USC 102(b).

#### Rejection Under 35 USC 103(a) over Herrington

The Office Action states that claims 32-33, 55 and 60-62 are rejected under 35 USC 103(a) as obvious over Herrington. Specifically, the Office Action states that, although Herrington does not specifically teach the anode surface area, this would have been an inherent property of Herrington because the apparatus of Herrington is the size of a pen and a person of ordinary skill in the art would have recognized that an electrode surface area which can fit in a chamber the size of a pen would be less than 30 cm<sup>2</sup> in size. The Office Action further states that Herrington teaches that the apparatus comprises a body which contains said electrolytic cell and power supply (Figure 1, numeral 108), a current such as a battery or solar cell (column 8, lines 1-5); a travel water purification device; is adapted to remove impurities and is adapted to kill microorganisms. The Applicants respectfully disagree with the finding of obviousness.

The Applicants again direct the Examiner's attention to the "Amendments" section of the instant paper, in which the Applicants have amended claims 1 and 63, from which the above-listed claims ultimately depend, to underscore that the apparatus of the present invention comprises a direct current power supply delivering less than 5 watts of power. The Applicants submit that Herrington neither teaches nor suggests an apparatus having a direct current supply and optimum power consumption characteristics. The Applicants further submit that Herrington relates entirely to a batch device with a holding chamber and, importantly, a single port that is employed as both an inlet for receiving a flow of electrolytic solution and an outlet for exiting the electrolytic solution whereas the apparatus of the present invention clearly comprises both an outlet port and a separate inlet port. Further, the apparatus of Herrington is adapted to create a concentrate that can be added to water for disinfection whereas the apparatus of the present invention is designed for the direct and continuous disinfection of water via entry of said water through the inlet of the claimed device and exit through a separate and distinct outlet. Such direct and continuous disinfection of water is not possible using the single port-comprising device of

Appl. No. 10/027,667  
Atty. Docket No. 8828  
Amdt. dated 06/10/2004  
Reply to Office Action of 03/10/2004  
Customer No. 27752

Herrington. Thus, the Applicants submit that it would not have been obvious to a person of ordinary skill in the art to use the anode surface area of the present invention as Herrington fails to teach or suggest every element of claims 1 and 63, from which the rejected claims directly depend. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the rejection to claims 32-33, 55 and 60-62 under 35 USC 103(a) over Herrington.

Rejection under 35 USC 103(a) over Ando in view of Weakly

The Office Action states that claims 67-93 are rejected under 35 USC 103(a) as being unpatentable over Ando in view of Weakly. Specifically, the Office Action states that it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified Ando to include the filler material of Weakly as Weakly purportedly teaches a specific filler such as activated carbon or resin. The Applicants respectfully disagree with the finding of obviousness.

The Applicants again wish to direct the Examiner's attention to the "Amendments" section of the instant paper, in which the Applicants have amended claim 63, from which the rejected claims directly depend. Specifically, the Applicants have amended claim 63 to underscore that the apparatus of the present invention clearly comprises a direct current supply, which delivers less than 5 watts of power. In light of the present amendments, the Applicants submit that Ando in view of Weakly fail to teach each and every element of the present invention, as amended. As discussed above, Weakly is limited entirely to an apparatus adapted for use with an alternating current. Indeed, the Applicants submit that the use of an alternating current in conjunction with the remaining elements of the present invention results in loss of a continuous electrical field and loss of unidirectional flow of ions. In turn, the loss of this electrical field and unidirectional flow results in loss of efficiency and lower percent conversion. Further, the Applicants submit that the alternating current system of Weakly prohibits the use of the subject device with batteries, and thus, inhibits the portability of the subject device.

Further, Ando relates entirely to a split stream device, having one inlet and two outlets whereas the apparatus of the present invention comprises a single stream with one inlet and one outlet. This is particularly important because the split stream system of Ando results in a solution that is too acidic for human consumption, and thus, can only be employed in the context of disinfection. Thus, the Applicants submit that even the suggested modification of Ando with the filler material of Weakly would fail to yield each material limitation of the present invention, as claimed in amended claim 63. As discussed above there exist several material differences between the disclosures of Ando and Weakly, and that of the present application. The Applicants

Appl. No. 10/027,667  
Atty. Docket No. 8828  
Amdt. dated 06/10/2004  
Reply to Office Action of 03/10/2004  
Customer No. 27752

submit that the intended combination would fail to produce an apparatus having a direct current power supply delivering less than 5 watts of power, and having a single stream with one inlet and one outlet, as claimed in claim 63, as amended and from which the rejected claims directly depend. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the rejection to claims 67-93 under 35 USC 103(a) over Ando in view of Weakly.

Rejection under 35 USC 103(a) Over Herrington in view of Weakly

The Office Action states that claims 34, 36-54 and 56-59 are rejected under 35 USC 103(a) as being unpatentable over Herrington in view of Weakly. Specifically, the Office Action states that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Herrington to include the filler material of Weakly because Weakly teaches the use of a specific filler material such as activated carbon or resin. The Applicants respectfully disagree with the finding of obviousness.

The Applicants again wish to direct the Examiner's attention to the "Amendments" section of the instant paper, in which the Applicants have amended claim 1, from which the above-rejected claims directly depend. Specifically, the Applicants have amended claim 1 to underscore that the apparatus of the present invention comprises a direct current power supply that delivers less than about 5 watts of power. The Applicants further note that the apparatus of the present invention comprises two distinct inlet and outlet ports, one through which the aqueous feed solution can pass into the cell, and an opposing and separate cell outlet from which the effluent can pass out of the electrolysis cell.

The Applicants submit that even the intended modification of Herrington with the filler of Weakly would fail to produce the apparatus of the present invention, as there exists several other material differences between the present invention and the devices of the applied references. Namely, Herrington relates entirely to a batch device having a single port that is employed as both the inlet through which the aqueous feed solution passes into the cell and the outlet from which the effluent can pass out of the cell. To reiterate, the apparatus of the present invention, as claimed in claim 1, comprises two separate and distinct inlet and outlet ports. Further, the disclosure of Weakly is limited entirely to devices operable on an alternating current power supply. The Applicants submit that the use of an alternating current in conjunction with the remaining elements of the present invention results in loss of a continuous electrical field and loss of unidirectional flow of ions. In turn, the loss of this electrical field and unidirectional flow results in loss of efficiency and lower percent conversion. Further, the Applicants submit that the

Appl. No. 10/027,667  
Atty. Docket No. 8828  
Amdt. dated 06/10/2004  
Reply to Office Action of 03/10/2004  
Customer No. 27752

alternating current system of Weakly prohibits the use of the subject device with batteries, and thus, inhibits the portability of the subject device.

Thus, the Applicants submit that the modification of Herrington with the filler material of weakly would result in an apparatus that is operable using an entirely different power supply (*i.e.*, alternating current) and a single port that is used as both an inlet and outlet. Thus, it would not have been obvious to modify Herrington with Weakly to arrive at the claimed invention. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the rejection to claims 34, 36-54 and 56-59 under 35 USC 103(a) over Weakly.

Rejection under 35 USC 103(a) over Ando in view of Herrington

The Office Action states that claim 64 is rejected under 35 USC 103(a) as being unpatentable over Ando in view of Herrington. Specifically, the Office Action states that it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified Ando to include the body of Herrington because Herrington teaches that the apparatus comprises a body which contains said electrolytic cell and power supply. The Applicants respectfully disagree with the finding of obviousness.

The disclosures of Ando and Herrington are summarized above. To reiterate, Ando relates entirely to a split stream device, having one inlet and two outlets whereas the apparatus of the present invention comprises a single stream with one inlet and one outlet. This is particularly important because the split stream system of Ando results in a solution that is too acidic for human consumption, and thus, can only be employed in the context of disinfection. Further, Herrington relates entirely to a batch device with a holding chamber and, importantly, a single port that is employed as both an inlet for receiving a flow of electrolytic solution and an outlet for exiting the electrolytic solution whereas the apparatus of the present invention is designed for the direct and continuous disinfection of water via entry of said water through the inlet of the claimed device and exit through a separate and distinct outlet. Such direct and continuous disinfection of water is not possible using the single port-comprising device of Herrington. Finally, the present invention, as amended, relates to an apparatus for electrolyzing an electrolytic solution comprising a direct current power supply that delivers less than 5 watts.

The Applicants therefore submit that even the intended modification of Ando with Herrington would fail to yield each and every limitation of the claimed invention, as claimed in claim 64, which depends directly from claim 63. The Applicants further submit that the cited references are not combinable as Ando relates to a split stream device with one inlet and one

Appl. No. 10/027,667  
Atty. Docket No. 8828  
Amdt. dated 06/10/2004  
Reply to Office Action of 03/10/2004  
Customer No. 27752

outlet, and Herrington relates to a device having a single port that is used as both an inlet and outlet. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the rejection to claim 64 under 35 USC 103(a) over Ando in view of Herrington.

Rejection under 35 USC 103(a) over Ando in view of Weakly

The Office Action states that claim 66 is rejected under 35 USC 103(a) as being unpatentable over Ando in view of Weakly. Specifically, the Office Action states that it would have been obvious for a person of ordinary skill in the art at the time the invention was made to have recalculated the electrolytic solution because recycling is an obvious engineering design improvement that comes from efficiency and economic considerations. The Applicants respectfully disagree with the finding of obviousness.

The disclosures of Ando and Weakly are summarized above. To reiterate, Ando relates entirely to a split stream device, having one inlet and two outlets *whereas* the apparatus of the present invention comprises a single stream with one inlet and one outlet. This is particularly important because the split stream system of Ando results in a solution that is too acidic for human consumption, and thus, can only be employed in the context of disinfection. Weakly is limited entirely to an apparatus adapted for use with an alternating current *whereas* the present invention, as amended, relates to an electrolysis apparatus comprising a direct current power supply that delivers less than about 5 watts of power. Indeed, the Applicants submit that the use of an alternating current in conjunction with the remaining elements of the present invention results in loss of a continuous electrical field and loss of unidirectional flow of ions. In turn, the loss of this electrical field and unidirectional flow results in loss of efficiency and lower percent conversion. Further, the Applicants submit that the alternating current system of Weakly prohibits the use of the subject device with batteries, and thus, inhibits the portability of the subject device.

Thus, the Applicants submit that even the suggested modification of the applied references would fail to yield the apparatus of the present invention, as claimed in claim 66 (which depends directly from claim 63, which has been amended herein). Indeed, the intended combination would result in an apparatus having a split stream, one inlet, two outlets and an alternating current supply. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the rejection to claim 66 under 35 USC 103(a) over Ando in view of Weakly.



Appl. No. 10/027,667  
Atty. Docket No. 8828  
Amdt. dated 06/10/2004  
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Customer No. 27752

Conclusion

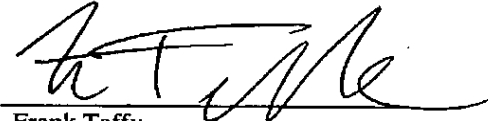
In light of the above remarks, it is requested that the Examiner reconsider and withdraw the rejections under 35 USC 102 and 103. Early and favorable action in the case is respectfully requested.

Applicants have made an earnest effort to place their application in proper form and to distinguish the invention as now claimed from the applied references. In view of the foregoing, Applicants respectfully request reconsideration of this application, entry of the amendments presented herein, and allowance of claims 1-93.

Respectfully submitted,

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